

Amendment to the Claims:

1. (Canceled)

2. (Currently amended) The radio frequency coil as set forth in ~~claim 1~~ claim 3, wherein the parallel spaced apart conductors of the birdcage section and the parallel spaced apart conductors of the TEM section each include one or more electrically interconnected components selected from a group consisting of:

- a linear printed copper trace on a printed circuit board,
- a discrete capacitance, and
- a conductive rod.

3. (Currently amended) ~~The A radio frequency coil as set forth in claim 1, for a magnetic resonance imaging system, the radio frequency coil comprising:~~

a birdcage section including a plurality of parallel spaced apart conductors and one or more end conductors aligned generally transverse to the spaced apart conductors, the birdcage section resonating at a birdcage resonant frequency;

a TEM section including a plurality of parallel spaced apart conductors and a radio frequency screen, the TEM section resonating at a TEM resonant frequency, wherein the birdcage resonant frequency equals the TEM resonant frequency, ~~the radio frequency coil further comprising: the birdcage section and the TEM section being relatively disposed with the parallel spaced apart conductors of each section aligned, the birdcage section and the TEM section cooperatively defining a subject receiving region; and~~

couplings between the birdcage section and the TEM section, the couplings cooperating with the birdcage section and the TEM section to define a volume resonator.

4. (Previously presented) The radio frequency coil as set forth in claim 3, wherein the couplings are selected from a group consisting of:

- a radio frequency inductive transformer,

a capacitive coupling,
a coaxial half wave cable, and
overlapping portions of the birdcage and TEM sections.

5. (Currently amended) The radio frequency coil as set forth in ~~claim 4~~ claim 3, further including:

couplings selectively arranged between selected spaced apart conductors of at least one of the birdcage section and the TEM section; and
at least one radio frequency transmit/receive means for selectively defining an array of resonators.

6. (Previously presented) The radio frequency coil as set forth in claim 5, wherein the couplings include one of:

phase-shifting impedances arranged between selected spaced apart conductors, and
a decoupling impedance network.

7. (Previously presented) The radio frequency coil as set forth in claim 5, wherein the array of resonators define one of:

a phased array of coils, and
a SENSE coil array.

8. (Previously presented) The radio frequency coil as set forth in claim 5, wherein the couplings include active switching components actively switched to effect the selective arrangement of the coupling/decoupling between selected parallel spaced apart conductors of at least one of the birdcage section and the TEM section.

9. (Currently amended) The radio frequency coil as set forth in ~~claim 4~~ claim 3, wherein:

the birdcage section has an arcuate cross section transverse to the parallel spaced apart conductors; and

the TEM section is substantially planar.

10. (Currently amended) The radio frequency coil as set forth in ~~claim 1~~ claim 3, further including:

a second birdcage section including a plurality of parallel spaced apart conductors and one or more cross conductors aligned generally transverse to the spaced apart conductors, the second birdcage coil resonating at a second birdcage resonant frequency also equal to the TEM resonant frequency, the second birdcage section being interchangeable with the birdcage section such that the second birdcage section and the TEM section are relatively disposed with the parallel spaced apart conductors of each section aligned, the second birdcage section and the TEM section cooperatively defining the subject receiving region.

11. (Currently amended) The radio frequency coil as set forth in ~~claim 1~~ claim 3, wherein the radio frequency screen of the TEM section includes:

a first screen portion disposed adjacent the parallel spaced apart conductors of the TEM section; and

an endcap screen portion transverse to the first screen portion and transverse to the parallel spaced apart conductors of the TEM section.

12. (Previously presented) The radio frequency coil as set forth in claim 11, wherein the parallel spaced apart conductors of the birdcage section are capacitively coupled with the endcap screen portion of the radio frequency screen of the TEM section.

13. (Currently amended) The radio frequency coil as set forth in ~~claim 1~~ claim 3, wherein the radio frequency screen includes:

a TEM screen portion coupled with the parallel spaced apart conductors of the TEM section; and

a shielding screen portion connected with the TEM screen portion, the shielding screen portion extending around outside the birdcage section and together

with the TEM screen portion defining a shielding radio frequency screen inside of which the birdcage section and the conductors of the TEM section are disposed.

14. (Currently amended) A magnetic resonance imaging scanner including:

a radio frequency coil ~~as set forth in claim 1~~ encompassing ~~the~~ a subject receiving region, the radio frequency coil comprising (i) a birdcage section including a plurality of parallel spaced apart conductors and one or more end conductors aligned generally transverse to the spaced apart conductors, the birdcage section resonating at a birdcage resonant frequency, a TEM section including a plurality of parallel spaced apart conductors and a radio frequency screen, the TEM section resonating at a TEM resonant frequency matches the birdcage resonant frequency, the birdcage section and the TEM section being relatively disposed with the parallel spaced apart conductors of each section aligned, the birdcage section and the TEM section cooperatively surrounding the subject receiving region, and (iii) couplings between the birdcage section and the TEM section, the couplings cooperating with the birdcage section and the TEM section to define a volume resonator;

a magnet which generates a temporally constant main magnetic field through the subject receiving region; and

a plurality of magnetic field gradient coils arranged to produce magnetic field gradients across the main magnetic field in the subject receiving region.

15. (Previously presented) The magnetic resonance imaging scanner as set forth in claim 14, wherein the radio frequency coil is further arranged with the conductive rods of the birdcage and TEM sections generally parallel to the main magnetic field.

16. (Previously presented) The magnetic resonance imaging scanner as set forth in claim 14, further including:

a subject supporting bridge having slots inside of which at least some of the parallel spaced apart conductors of the TEM section are disposed.

17. (Previously presented) The magnetic resonance imaging scanner as set forth in claim 14, further including:

a shielding radio frequency screen disposed around the radio frequency coil and spaced apart therefrom.

18. (Previously presented) The magnetic resonance imaging scanner as set forth in claim 14, further including:

a second birdcage section including a plurality of parallel spaced apart conductors and one or more cross conductors aligned generally transverse to the spaced apart conductors, the second birdcage coil resonating at a second birdcage resonant frequency, the second birdcage section being swappable for the birdcage section of the radio frequency coil such that the second birdcage section and the TEM section are relatively disposed with the parallel spaced apart conductors of each section aligned, the second birdcage section and the TEM section cooperatively defining the subject receiving region.

19-20. (Canceled)

21. (New) A radio frequency coil comprising:

a birdcage section including a plurality of parallel spaced apart conductors and one or more end conductors aligned generally transverse to the spaced apart conductors;

a TEM section including a plurality of parallel spaced apart conductors and a radio frequency screen, the birdcage section and the TEM section being relatively disposed with the parallel spaced apart conductors of each section aligned, neither the birdcage section nor the TEM section alone defining a complete circumference around a subject receiving region but the birdcage section and the TEM section together cooperatively defining a complete circumference around the subject receiving region; and

couplings between the birdcage section and the TEM section, the couplings cooperating with the birdcage section and the TEM section to define a volume resonator.

22. (New) The radio frequency coil as set forth in claim 21, wherein the couplings are selected from a group consisting of:

- a radio frequency inductive transformer,
- a capacitive coupling,
- a coaxial half wave cable, and
- overlapping portions of the birdcage and TEM sections.

23. (New) The radio frequency coil as set forth in claim 21, further comprising:

- couplings selectively arranged between selected spaced apart conductors of at least one of the birdcage section and the TEM section; and
- at least one radio frequency transmit/receive means for selectively defining an array of resonators.